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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,830	10/30/2003	Yasutaka Nishida	HIRA.0128	7192

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EXAMINER

MERCEDES, DISMERY E

ART UNIT PAPER NUMBER

2651

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/695,830

Applicant(s)

NISHIDA ET AL.

Examiner

Dismery E Mercedes

Art Unit

2651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/30/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on October 30, 2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

2. Figures 13A-17 should be designated by a legend such as --Prior Art--, because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art, hereinafter, AAPA (pages 1-3 of instant specification & Figures 13-17) in view of Nishida et al. (US 6,657,813 B2), further in view of Ishida et al. (US 5,467,330).

AAPA discloses a magnetic recording apparatus comprising: a magnetic recording medium having a soft magnetic underlayer and a magnetic recording layer (pages 1-2 of the instant specification); a magnetic head including a recording head (as depicted in Figures 13A-13B & lines 1-5 of page 2 of instant specification), a signal processing circuit for converting user data into a recording data sequence on a sector block by sector block basis (on page 2, second paragraph, & FIG.14 of instant specification).

AAPA fails to specifically disclose a current driver for converting the recording data sequence into a recording current that is applied to the recording head. However, Nishida et al. discloses a magnetic head where a write current is applied to a coil wound around the main pole of the recording head, on (col.5, lines 36-45 & Figures 5-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement Nishida's magnetic head in AAPA's apparatus, the motivation being because Nishida teaches that a write current induces the write field of the recording head (line 43 of Nishida et al.).

AAPA fails to particularly disclose the signal processing circuit adds at the end of the recording data sequence for each sector block a repetition pattern of a minimum bit length for the particular block. However, Ishida et al. discloses a fixed pattern of minimum run length (as depicted in Figures 4b-e, & col. 7, lines 20-24 and 55-59).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement a repetitive pattern of minimum run length in AAPA's apparatus as suggested by Ishida et al., the motivation being because it would provide AAPA's apparatus with the enhanced capability of reducing the thermal stress on the medium, thus restraining the

Art Unit: 2651

deterioration of the medium and improving the repetitive frequency. Also it allows for synchronization of the signal (col.7, lines 12-14, 20-24 of Ishida et al.).

As to Claim 2, the combination further discloses a repetition pattern of the minimum bit length (as depicted in Figures 4b-e, & col. 7, lines 20-24 and 55-59 of Ishida et al.) after a postamble portion that follows an ECC portion (AAPA, FIG.14).

As to Claim 3, in the obvious combination, Ishida et al. further discloses a length of the minimum bit length added is four or more bits (as depicted in Figures 4b-e).

As to Claim 4, in the obvious combination, Ishida et al. further discloses a length of the minimum bit length added is one byte or more (as depicted in Figures 4b-e).

As to Claim 5, in the obvious combination, Nishida et al. further discloses a recording head is a single pole type head having a main pole and an auxiliary pole (as depicted in Figures 4-6).

Method claims 10-11 are drawn to the method of using the corresponding apparatus claimed in claims 1 and 3. Therefore, method claims 10-11 correspond to apparatus claims 1 & 3 and are therefore rejected for the same reasons set forth, supra.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art, hereinafter, AAPA (pages 1-3 of instant specification & Figures 13-17) in view Nishida et al. (hereinafter, Nishida, US 6,657,813 B2), further in view of Ishida et al. (US 5,467,330), further in view of Kuroda et al. (6,775,099 B2).

The combination of AAPA, Ishida et al., and Nishida et al. discloses the apparatus as claimed in claim 1, but fails to particularly discloses a track pitch of 250 nm or less. However, Kuroda et al. discloses such (col.5, line 27-28 & FIG.9).

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to use a track pitch of 250nms or less to in the apparatus disclosed in the obvious combination of AAPA, Ishida et al. and Nishida, the motivation being because it would provide the apparatus with the enhanced capability of decreasing the influence of leakage magnetic flux, thus increasing the field gradient and decreasing the magnetization transition (col.5, line 30-35, col.6, lines 40-43 of Kuroda et al.).

6. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art, hereinafter, AAPA (pages 1-3 of instant specification & Figures 13-17), in view of Ishida et al. (US 5,467,330).

As to Claim 7, AAPA discloses a magnetic recording apparatus comprising: a magnetic recording medium having a soft magnetic underlayer and a magnetic recording layer (pages 1-2 of the instant specification); a magnetic head including a recording head (as depicted in Figures 13A-13B & lines 1-5 of page 2 of instant specification), a signal processing circuit for converting user data into a recording data sequence on a sector block by sector block basis (on page 2, second paragraph, & FIG.14 of instant specification).

AAPA fails to particularly disclose the signal processing circuit adds at the end of the recording data sequence for each sector block a repetition pattern of a minimum bit length for the particular block. However, Ishida et al. discloses such (as depicted in Figures 4b-e, & col. 7, lines 20-24 and 55-59).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement Ishida's et al. technique in AAPA's apparatus, the motivation being because it would provide AAPA's apparatus with the enhanced capability of reducing the

Art Unit: 2651

thermal stress on the medium, thus restraining the deterioration of the medium and improving the repetitive frequency. Also it allows for synchronization of the signal (col.7, lines 12-14, 20-24 of Ishida et al.).

As to Claim 8, the combination further discloses a repetition pattern of the minimum bit length (as depicted in Figures 4b-e, & col. 7, lines 20-24 and 55-59 of Ishida et al.) after a postamble portion that follows an ECC portion (as depicted in FIG.14, of AAPA).

As to Claim 9, the combination further discloses a length of the minimum bit length added is four or more bits (as depicted in Figures 4b-e, & col. 7, lines 20-24 and 55-59).

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Nishida et al. (US 6,657,813 B2) discloses a perpendicular magnetic recording system.
- Igarashi et al. (US 6,728,051 B2) discloses a recording equalizer and magnetic recording/reproducing apparatus using the equalizer.
- Fang et al. (US 6,778,481 B2) discloses a process for measuring nonlinear transition shift (NLTS) at high recording densities with a giant magnetoresistive (GMR) head.
- Malone, Sr. (US 6,583,943 B2) discloses a system and method for providing nonadjacent redundancy synchronization bytes.
- Oka et al. (4,160,236) discloses a feedback shift register.
- Nakagawa et al. (US 5,986,592) discloses an encoder decoder device not using an a/d converter and method thereof.

Art Unit: 2651


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dismery E Mercedes whose telephone number is 703-306-4082. The examiner can normally be reached on Monday - Friday, from 9:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 703-305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dismery E Mercedes
Examiner
Art Unit 2651

DM



W. R. YOUNG
PRIMARY EXAMINER